

CLAIMS

What is claimed is:

1. An optical band pass interferometer, comprising:
- 5 (a) a first flat substrate having a very low absorption loss including a first and a second surface; said first surface having a highly reflective coefficient of r_1 , and a transmission coefficient of t_1 to enable output of light beams;
- (b) a second flat substrate having a very low absorption loss including a first surface and a second surface; said first surface having a highly reflective coefficient of r_2 wherein r_2 is greater than r_1 ; said second flat substrate being mounted parallel to said first flat substrate with respective first surfaces facing each other;
- (c) a wave guide for guiding an input light beam to reflect off of said second surface at a near normal incidence angle;
- (d) an optical medium having a predetermined refractive index located between said first and second surfaces; and;
- (e) an optical converging element spaced from said second surface of said first flat substrate for converging said output light beams incident thereon into a focused spot.
2. An optical band pass interferometer as in claim 1 wherein said near normal incidence angle is approximately 1 degree.
- 20 3. An optical band pass interferometer as in claim 1 wherein said input light beam is a collimated light beam.
4. An optical band pass interferometer as in claim 1 further comprising an adjustable spacer positioned between said first and second surfaces for parallel mounting of said flat substrates and for adjusting the spacing between said first and second surfaces;

5. An optical band pass interferometer as in claim 1 further comprising a refractive index adjuster for adjusting the refractive index of said optical medium;

6. An optical band pass interferometer as in claim 4 further comprising a first voltage source connected to said adjustable spacer for electrically adjusting the spacing between said first and second surfaces.

7. An optical band pass interferometer as in claim 5 further comprising a second voltage source connected to said refractive index adjuster for electrically adjusting the refractive index of said optical medium.

8. An optical band pass interferometer as in claim 6 wherein said adjustable spacer is a piezo-electric control voltage device.

9. An optical band pass interferometer as in claim 7 wherein said refractive index adjuster is an electro-optical control voltage device.

10. An optical band pass interferometer as in claim 1 further comprising:

a displacement transducer for measuring the changes in the spacing between said first and second surfaces; said displacement transducer to generate a input signal for a controller; and a controller for monitoring the tunable operation of said interferometer using said input signal generated by said displacement transducer.

11. An optical band pass interferometer as in claim 1 wherein said optical converging element is chosen from the group consisting of a spherical lens system, an aspherical lens system, a gradient-index (GRIN) lens system, any combination of the foregoing systems, and any other optical converging system constructed to collect and converge said output light beams.

12. An optical band pass interferometer as in claim 1 wherein said focused spot is an input aperture of an output optical fiber.

13. A tunable optical band pass interferometer, comprising:

DATE	TIME	LOCATION	REMARKS
10	10:00	1000	1000
11	11:00	1100	1100
12	12:00	1200	1200
13	13:00	1300	1300
14	14:00	1400	1400
15	15:00	1500	1500
16	16:00	1600	1600
17	17:00	1700	1700
18	18:00	1800	1800
19	19:00	1900	1900
20	20:00	2000	2000
21	21:00	2100	2100
22	22:00	2200	2200
23	23:00	2300	2300
24	24:00	2400	2400
25	25:00	2500	2500
26	26:00	2600	2600
27	27:00	2700	2700
28	28:00	2800	2800
29	29:00	2900	2900
30	30:00	3000	3000
31	31:00	3100	3100
32	32:00	3200	3200
33	33:00	3300	3300
34	34:00	3400	3400
35	35:00	3500	3500
36	36:00	3600	3600
37	37:00	3700	3700
38	38:00	3800	3800
39	39:00	3900	3900
40	40:00	4000	4000
41	41:00	4100	4100
42	42:00	4200	4200
43	43:00	4300	4300
44	44:00	4400	4400
45	45:00	4500	4500
46	46:00	4600	4600
47	47:00	4700	4700
48	48:00	4800	4800
49	49:00	4900	4900
50	50:00	5000	5000
51	51:00	5100	5100
52	52:00	5200	5200
53	53:00	5300	5300
54	54:00	5400	5400
55	55:00	5500	5500
56	56:00	5600	5600
57	57:00	5700	5700
58	58:00	5800	5800
59	59:00	5900	5900
60	60:00	6000	6000
61	61:00	6100	6100
62	62:00	6200	6200
63	63:00	6300	6300
64	64:00	6400	6400
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67	67:00	6700	6700
68	68:00	6800	6800
69	69:00	6900	6900
70	70:00	7000	7000
71	71:00	7100	7100
72	72:00	7200	7200
73	73:00	7300	7300
74	74:00	7400	7400
75	75:00	7500	7500
76	76:00	7600	7600
77	77:00	7700	7700
78	78:00	7800	7800
79	79:00	7900	7900
80	80:00	8000	8000
81	81:00	8100	8100
82	82:00	8200	8200
83	83:00	8300	8300
84	84:00	8400	8400
85	85:00	8500	8500
86	86:00	8600	8600
87	87:00	8700	8700
88	88:00	8800	8800
89	89:00	8900	8900
90	90:00	9000	9000
91	91:00	9100	9100
92	92:00	9200	9200
93	93:00	9300	9300
94	94:00	9400	9400
95	95:00	9500	9500
96	96:00	9600	9600
97	97:00	9700	9700

- (a) a first flat substrate having a very low absorption loss including a first and a second surface; said first surface having a highly reflective coefficient of r_1 , and a transmission coefficient of t_1 to enable output of light beams;
 - (b) a second flat substrate having a very low absorption loss including a first surface and a second surface; said first surface having a highly reflective coefficient of r_2 wherein r_2 is greater than r_1 ; said second flat substrate being mounted parallel to said first flat substrate with respective first surfaces facing each other;
 - (c) a wave guide for guiding an input light beam to reflect off of said second surface at a near normal incidence angle;
 - (d) an optical medium having a predetermined refractive index located between said first and second surfaces;
 - (e) an optical converging element spaced from said second surface of said first flat substrate for converging said output light beams incident thereon into a focused spot;
 - (f) an adjustable spacer positioned between said first and second surfaces for parallel mounting of said flat substrates and for adjusting the spacing between said first and second surfaces;
 - (g) a refractive index adjuster for adjusting the refractive index of said optical medium; an optical converging element spaced from said second surface of said second flat substrate for converging said output light beams incident thereon into a focused spot;
 - (h) a displacement transducer for measuring the changes in the spacing between said first and second surfaces; said displacement transducer to generate a input signal to be used by a controller; and;
 - (i) a controller for monitoring the tunable operation of said interferometer using said input signal generated by said displacement transducer.
14. An optical band pass interferometer as in claim 13 wherein said near normal incidence angle is approximately 1 degree.

15. An optical band pass interferometer as in claim 13 wherein said input light beam is a collimated light beam.
16. An optical band pass interferometer as in claim 13 further comprising a first voltage source connected to said adjustable spacer for electrically adjusting the spacing between said first and second surfaces.
17. An optical band pass interferometer as in claim 13 further comprising a second voltage source connected to said refractive index adjuster for electrically adjusting the refractive index of said optical medium.
18. An optical band pass interferometer as in claim 16 wherein said adjustable spacer is a piezo-electric control voltage device.
19. An optical band pass interferometer as in claim 17 wherein said refractive index adjuster is an electro-optical control voltage device.
20. An optical band pass interferometer as in claim 13 wherein said optical converging element is chosen from the group consisting of a spherical lens system, an aspherical lens system, a gradient-index (GRIN) lens system, any combination of the foregoing systems, and any other optical converging system constructed to collect and converge said output light beams.
21. An optical band pass interferometer, comprising:
- (a) a first flat substrate having a very low absorption loss including a first and a second surface; said first surface having a highly reflective coefficient of r_1 , and a transmission coefficient of t_1 to enable output of light beams;
 - (b) a second flat substrate having a very low absorption loss including a first surface and a second surface; said first surface having a highly reflective coefficient of r_2 wherein r_2 is greater than r_1 ; said second flat substrate being mounted parallel to said first flat substrate with respective first surfaces facing each other and said spacing between said respective first surfaces being comparable with one wavelength of light;

(c) a wave guide guiding an input light beam to reflect off said second surface at a near normal incidence angle;

(d) an optical medium having a predetermined refractive index located between said first and second surfaces; and;

5 (e) an optical converging element spaced from said second surface of said first flat substrate for converging said output light beams incident thereon into a focused spot.

22. An optical band pass interferometer as in claim 21 wherein said near normal incidence angle is approximately 1 degree.

23. An optical band pass interferometer as in claim 21 wherein said input light beam is a collimated light beam.

24. An optical band pass interferometer as in claim 21 further comprising an adjustable spacer positioned between said first and second surfaces for parallel mounting of said flat substrates and for adjusting the spacing between said first and second surfaces.

25. An optical band pass interferometer as in claim 21 further comprising a refractive index adjuster for adjusting the refractive index of said optical medium.

26. An optical band pass interferometer as in claim 24 further comprising a first voltage source connected to said adjustable spacer for electrically adjusting the spacing between said first and second surfaces.

20 27. An optical band pass interferometer as in claim 26 further comprising a second voltage source connected to said refractive index adjuster for electrically adjusting the refractive index of said optical medium.

28. An optical band pass interferometer as in claim 26 wherein said adjustable spacer is a piezo-electric control voltage device.

25 29. An optical band pass interferometer as in claim 27 wherein said refractive index adjuster is an electro-optical control voltage device.

30. An optical band pass interferometer as in claim 21 further comprising
a displacement transducer for measuring the changes in the spacing between said first and second
surfaces; said displacement transducer to generate a input signal for a controller; and
a controller for monitoring the tunable operation of said interferometer using said input signal
generated by said displacement transducer.

31. An optical band pass interferometer as in claim 21 wherein said optical converging element is
chosen from the group consisting of a spherical lens system, an aspherical lens system, a gradient-
index (GRIN) lens system, any combination of the foregoing systems, and any other optical
converging system constructed to collect and converge said output light beams.

32. An optical band pass interferometer as in claim 21 wherein said focused spot is an input aperture
of an output optical fiber.

33. A tunable optical band pass interferometer, comprising:

(a) a first flat substrate having a very low absorption loss including a first and a second surface;
said first surface having a highly reflective coefficient of r_1 , and a transmission coefficient of
 t_1 to enable output of light beams;

(b) a second flat substrate having a very low absorption loss including a first surface and a second
surface; said first surface having a highly reflective coefficient of r_2 wherein r_2 is greater than
 r_1 ; said second flat substrate being mounted parallel to said first flat substrate with respective
first surfaces facing each other and said spacing between said respective first surfaces being
less than one wavelength of light;

(c) a wave guide for guiding an input light beam to reflect off of said second surface at a near
normal incidence angle;

(d) an optical medium having a predetermined refractive index located between said first and
second surfaces;

- (e) an optical converging element spaced from said second surface of said first flat substrate for converging said output light beams incident thereon into a focused spot;
- (f) an adjustable spacer positioned between said first and second surfaces for parallel mounting of said flat substrates and for adjusting the spacing between said first and second surfaces;
- 5 (g) a refractive index adjuster for adjusting the refractive index of said optical medium; an optical converging element spaced from said second surface of said first flat substrate for converging said output light beams incident thereon into a focused spot;
- (h) a displacement transducer for measuring the changes in the spacing between said first and second surfaces; said displacement transducer to generate a input signal for a controller; and
- 10 (i) a controller for monitoring the tunable operation of said interferometer using said input signal generated by said displacement transducer.

34. An optical band pass interferometer as in claim 33 wherein said near normal incidence angle is approximately 1 degree.

35. An optical band pass interferometer as in claim 33 wherein said input light beam is a collimated light beam.

36. An optical band pass interferometer as in claim 33 further comprising a first voltage source connected to said adjustable spacer for electrically adjusting the spacing between said first and second surfaces.

37. An optical band pass interferometer as in claim 33 further comprising a second voltage source connected to said refractive index adjuster for electrically adjusting the refractive index of said optical medium.

38. An optical band pass interferometer as in claim 36 wherein said adjustable spacer is a piezo-electric control voltage device.

39. An optical band pass interferometer as in claim 37 wherein said refractive index adjuster is an electro-optical control voltage device.

40. An optical band pass interferometer as in claim 33 wherein said optical converging element is chosen from the group consisting of a spherical lens system, an aspherical lens system, a gradient-index (GRIN) lens system, any combination of the foregoing systems, and any other optical converging system constructed to collect and converge said output light beams.

5 41. An optical band pass interferometer as in claim 33 wherein said focused spot is an input aperture of an output optical fiber.

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